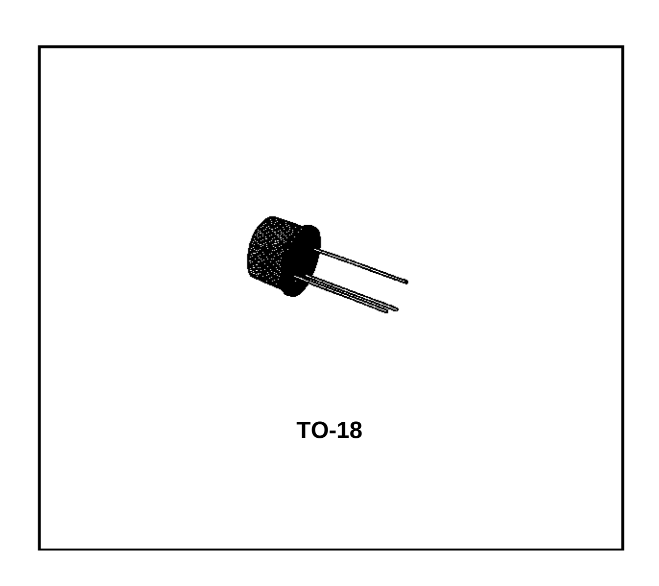
SGS-THOMSON MICROELECTRONICS

BC107
BC108-BC109

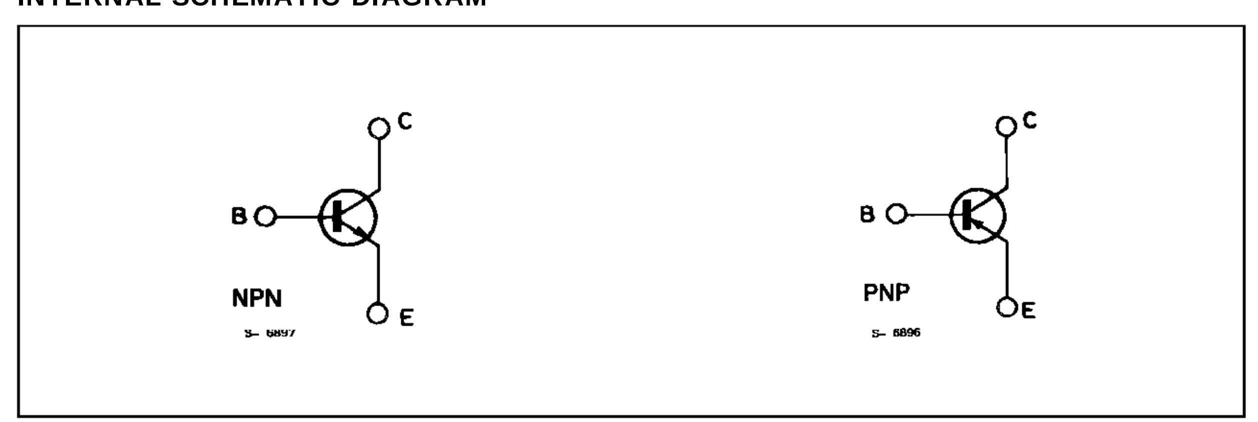
LOW NOISE GENERAL PURPOSE AUDIO AMPLIFIERS

DESCRIPTION

The BC107, BC108 and BC109 are silicon planar epitaxial NPN transistors in TO-18 metal case.They are suitable for use in driver stages, low noise input stages and signal processing circuits of television receivers. The complementary PNP types are respectively the BC177, BC178 and BC179.


TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BC107	BC108	BC109	
V_{CBO}	Collector-base Voltage (I_E = 0)	50	30	30	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	45	20	20	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	6	5	5	V
I_C	Collector Current	100			mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.3 0.75			W W
T_{stg}	Storage Temperature	– 55 to 175			°C
T_j	Junction Temperature	175			°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	200	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	500	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BC107**				
		V_{CB} = 40 V			15	nA
		V_{CB} = 40 V T_{amb} = 150 °C			15	µA
		for **BC108-BC 109**				
		V_{CB} = 20 V			15	µA
		V_{CB} = 20 V T_{amb} = 150 °C			15	µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 10 µA for **BC107**	50			V
		for **BC108**	30			V
		for **BC109**	30			V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = 10 mA for **BC107**	45			V
		for **BC108**	20			V
		for **BC109**	20			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 10 µA for **BC107**	6			V
		for **BC108**	5			V
		for **BC109**	5			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA		70	250	mV
		I_C = 100 mA I_B = 5 mA		200	600	mV
V_{BE}*	Base-emitter Voltage	I_C = 2 mA V_{CE} = 5 V	550	650	700	mV
		I_C = 10 mA V_{CE} = 5 V		700	700	mV
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA		750		mV
		I_C = 100 mA I_B = 5 mA		900		mV
h_{FE}*	DC Current Gain	I_C = 2 mA V_{CE} = 5 V				
		for **BC107**	110	230	450	
		for **BC107** Gr. A	110	180	220	
		for **BC107** Gr. B	200	290	450	
		for **BC108**	110	350	800	
		for **BC108** Gr. A	110	180	220	
		for **BC108** Gr. B	200	290	450	
		for **BC108** Gr. C	420	520	800	
		for **BC109**	200	350	800	
		for **BC109** Gr. B	200	290	450	
		for **BC109** Gr. C	420	520	800	
		I_C = 10 µA V_{CE} = 5 V				
		for **BC107**		120		
		for **BC107** Gr. A		90		
		for **BC107** Gr. B	40	150		
		for **BC108**		120		
		for **BC108** Gr. A		90		
		for **BC108** Gr. B	40	150		
		for **BC108** Gr. C	100	270		
		for **BC109**	40			
		for **BC109** Gr. B	40	150		
		for **BC109** Gr. C	100	270		

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.



ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{fe}	Small Signal Current Gain	I_C = 2 mA V_{CE} = 5 V f = 1 kHz for **BC107** for **BC107** Gr. A for **BC107** Gr. B for **BC108** for **BC108** Gr. A for **BC108** Gr. B for **BC108** Gr. C for **BC109** for **BC109** Gr. B for **BC109** Gr. C I_C = 10 mA V_{CE} = 10 V f = 100 MHz		 250 190 300 370 190 300 500 370 300 550 2		
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz		4	6	pF
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 MHz		12		pF
NF	Noise Figure	I_C = 0.2 mA V_{CE} = 5 V R_g = 2 kΩ f = 1 kHz B = 200 Hz for **BC107** for **BC108** for **BC109** I_C = 0.2 mA V_{CE} = 5 V R_g = 2 kΩ f = 10 Hz to 10 kHz B = 15.7 kHz for **BC109**		 2 2 1.5 1.5	 10 10 4 4	 dB dB dB dB
h_{ie}	Input Impedance	I_C = 2 mA V_{CE} = 5 V f = 1 kHz for **BC107** for **BC107** Gr. A for **BC107** Gr. B for **BC108** for **BC108** Gr. A for **BC108** Gr. B for **BC108** Gr. C for **BC109** for **BC109** Gr. B for **BC109** Gr. C		 4 3 4.8 5.5 3 4.8 7 5.5 4.8 7		 kΩ kΩ kΩ kΩ kΩ kΩ kΩ kΩ kΩ kΩ

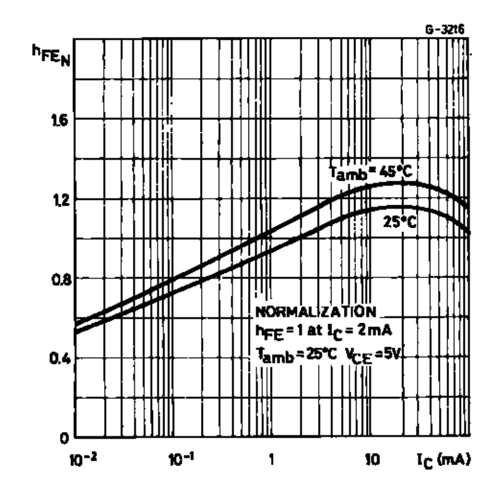
* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

ELECTRICAL CHARACTERISTICS (continued)

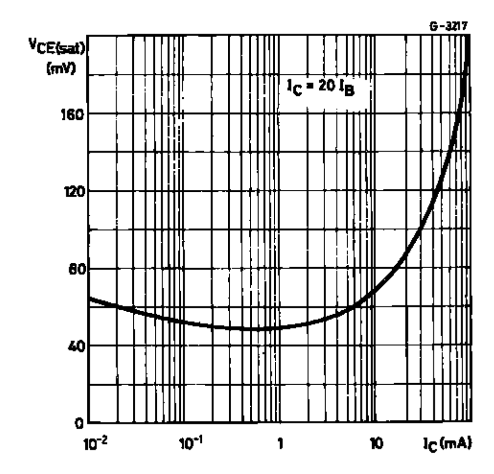
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{re}	Reverse Voltage Ratio	I_C = 2 mA V_{CE} = 5 V f = 1 kHz				
		for **BC107**		$2.2x10^{-4}$		
		for **BC107** Gr. A		$1.7x10^{-4}$		
		for **BC107** Gr. B		$2.7x10^{-4}$		
		for **BC108**		$3.1x10^{-4}$		
		for **BC108** Gr. A		$1.7x10^{-4}$		
		for **BC108** Gr. B		$2.7x10^{-4}$		
		for **BC108** Gr. C		$3.8x10^{-4}$		
		for **BC109**		$3.1x10^{-4}$		
		for **BC109** Gr. B		$2.7x10^{-4}$		
		for **BC109** Gr. C		$3.8x10^{-4}$		
h_{oe}	Output Admittance	I_C = 2 mA V_{CE} = 5 V f = 1 kHz				
		for **BC107**		20		µS
		for **BC107** Gr. A		13		µS
		for **BC107** Gr. B		26		µS
		for **BC108**		30		µS
		for **BC108** Gr. A		13		µS
		for **BC108** Gr. B		26		µS
		for **BC108** Gr. C		34		µS
		for **BC109**		30		µS
		for **BC109** Gr. B		26		µS
		for **BC109** Gr. C		34		µS

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

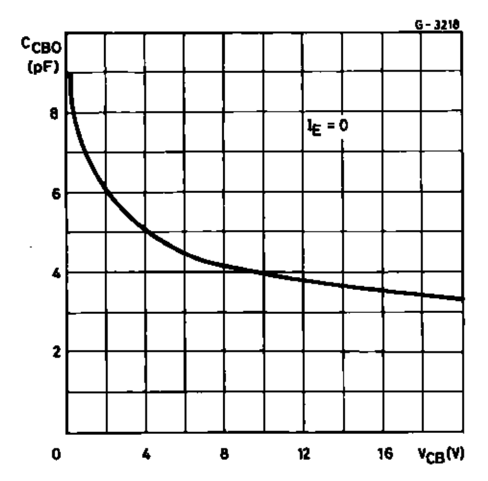
DC Normalized Current Gain.



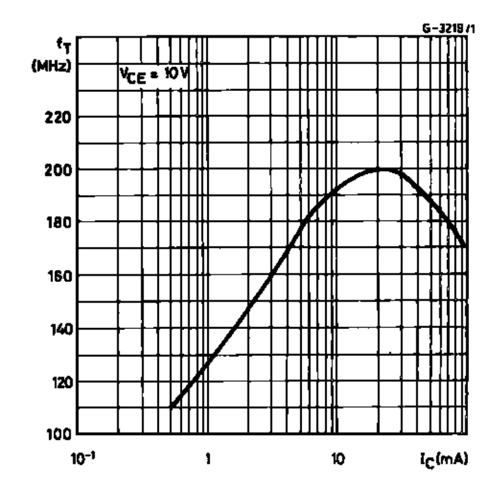
Collector--emitter Saturation Voltage.



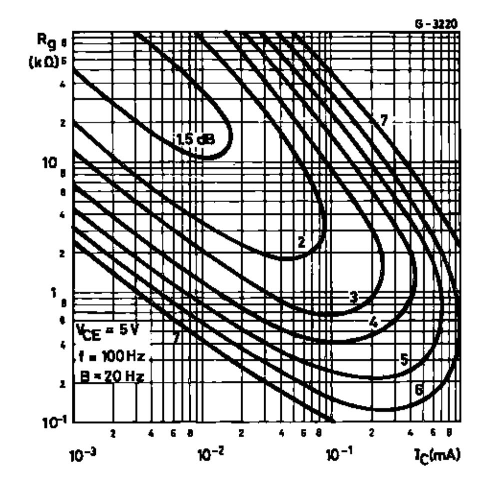
Collector-base Capacitance.



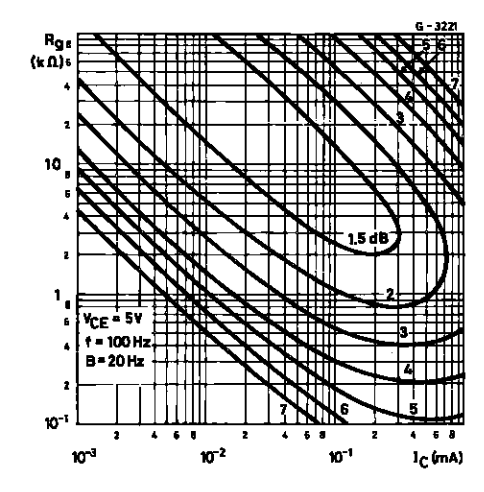
Transition Frequency.



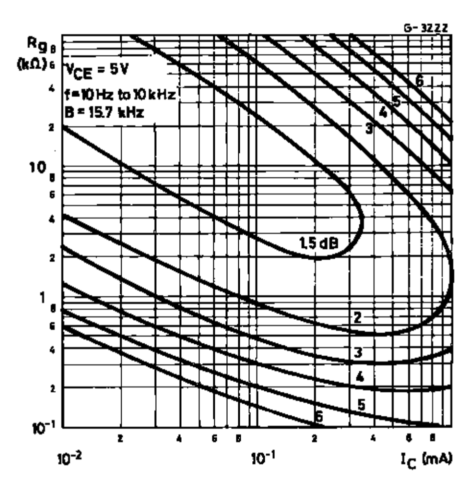
Noise Figure (for **BC 109** only).



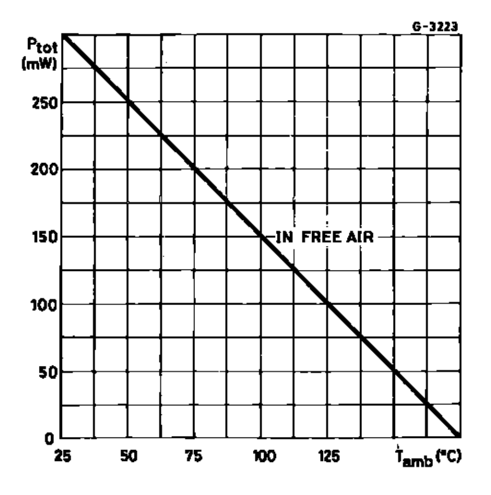
Noise Figure (for **BC 109** only).



Noise Figure (for **BC 109** only).

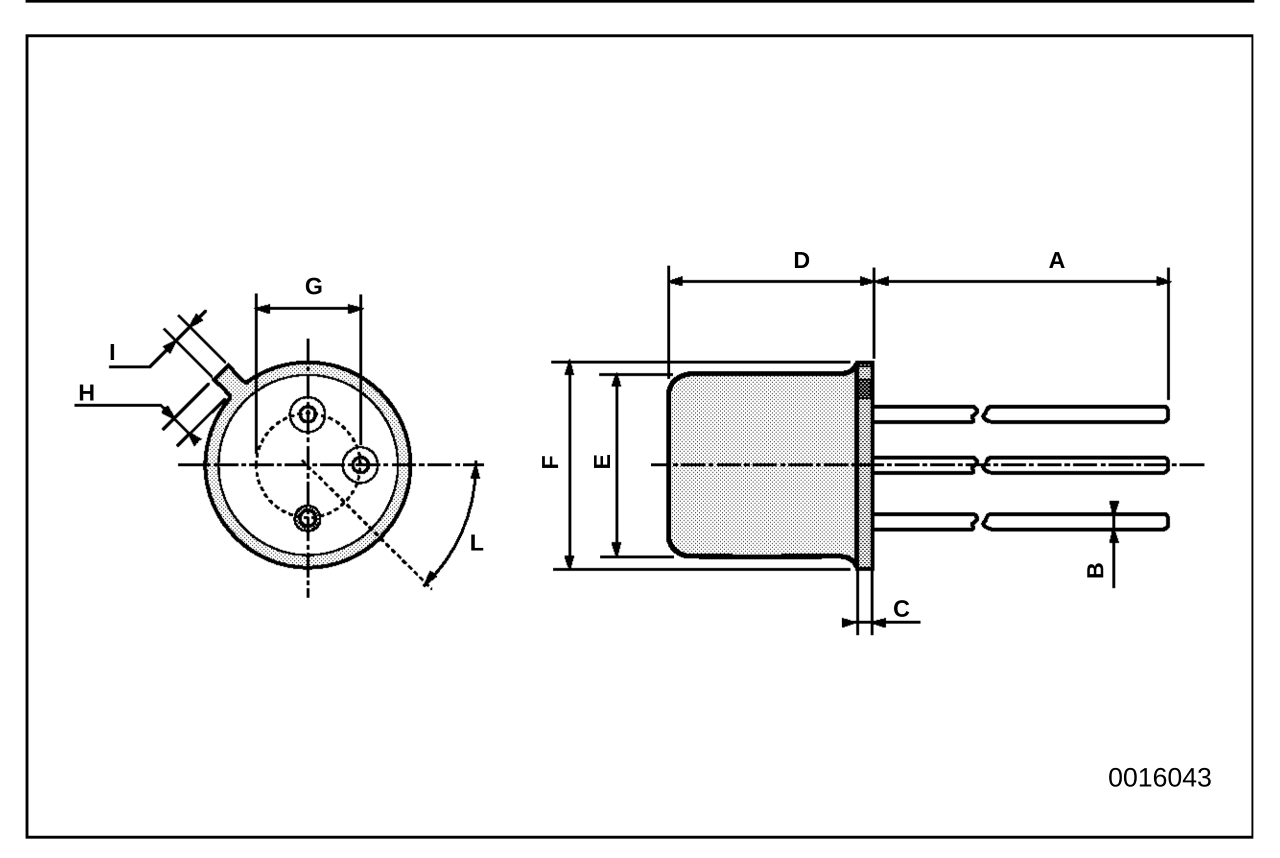


Power Rating Chart.



TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45^{o}			45^{o}		




SGS-THOMSON
MICROELECTRONICS